Exhibit 8

Rondorfite

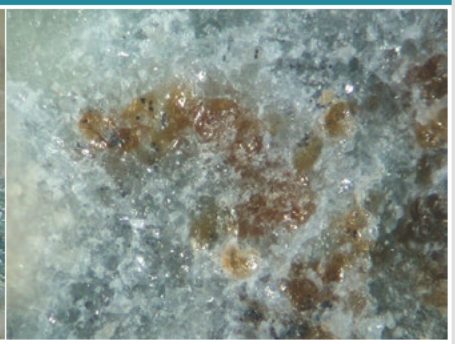
Photos of Rondorf te (7)

Rondorfite, etc.

Caspa qua y, Be e be g vo ca o, ge , Maye , Maye Kob e z, R ea d aa a e, Ge ma y

Rondorfite

Caspa qua y, Be e be g vo ca o, ge , Maye , Maye Kob e z, R ea d aa a e, Ge ma y

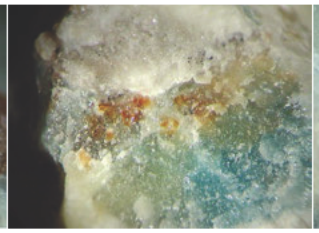


Rondorfite, etc.

Caspa qua y, Be e be g vo ca o, ge , Maye , Maye Kob e z, R ea d aa a e, Ge ma y

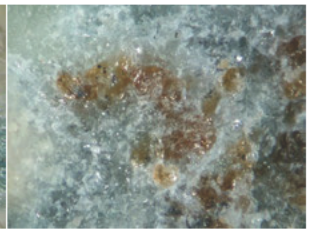
Rondorfite, etc.

Caspa qua y, Be e be g vo ca o, ge , Maye , Maye Kob e z, R ea d aa a e, Ge ma y



Rondorfite

Caspa qua y, Be e be g vo ca o, ge , Maye , Maye Kob e z, R ea d aa a e, Ge ma y

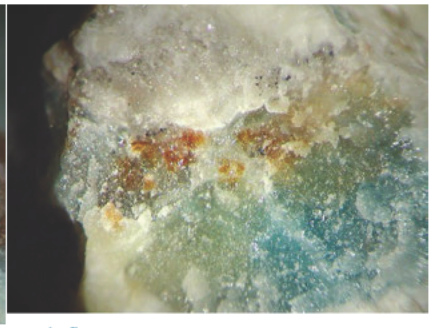


Rondorfite, etc.

Caspa qua y, Be e be g vo ca o, ge , Maye , Maye Kob e z, R ea d aa a e, Ge ma y

Rondorfite, etc.

Caspa qua y, Be e be g vo ca o, ge , Maye , Maye Kob e z, R ea d aa a e, Ge ma y



Rondorfite

Caspa qua y, Be e be g vo ca o, ge , Maye , Maye Kob e z, R ea d aa a e, Ge ma y

Hide all sections Show all sections

About Rondorfite

H de

Formula: $Ca_8Mg(SO_4)_4C_2$

Colour: orange brown to amber, green

Lustre: V treous

Specific Gravity: 3 03

Crystal System: Isometr c

Name: Named n honor of A ce and Eugen Rondorf, of Neuw ed, Germany, co ectors who d scovered the m nera w th Bernd Ternes n 1979 They a so d scovered the m nera a marud te

Type Locality: ⓘ Caspar quar y, Be erberg vo cano, Ettr ngen, Mayen, Mayen Kob enz, Rh ne and Pa at nate, Germany

Bellerberg lunch break

Caspa qua y, Be e be g vo ca o, ge , Maye , Maye Kob e z, R ea d aa a e, Ge ma y

The co our d fference resu ts from d fferent O/C rat o The orange co our resu ts from (1) Fe^{3+}/A subst tut on for Mg, (2) presence of atyp ca MgO_4 tetrahedron, or (3) e ectronegat v ty Non equ br um C pos t ons and the presence of Ca C bonds are conf rmed (Du sk et a , 2015)

Classification of Rondorfite

H de

IMA status: Approved

Approval Year: 1997

First Published: 2004

Strunz 8th ed.: 8/B 05 05

Nickel-Strunz 10th (pending) ed.: 9 AB 20

9 SILICATES (Germanates)
A Nesos cates
B Nesos cates w thout add t ona an ons; cat ons n [4] and greater coord nat on

Physical Properties of Rondorfite

H de

Lustre: V treous

Transparency: Trans ucent

Colour: orange brown to amber, green

Streak: pa e ye ow

Tenacity: Br tt e

Cleavage: None Observed

Fracture: Concho da

Density: 3 03 g/cm^3 (Measured)

Chemical Properties of Rondorfite

H de

Formula: $Ca_8Mg(SO_4)_4C_2$

Elements listed: Ca, C , Mg, O, S search for m nera s w th s m ar chem stry

Crystallography of Rondorfite

H de

Crystal System: Isometr c

Class (H-M): *m*3 (2/*m* $\bar{3}$) D p o da

Cell Parameters: a = 15 08 Å

Unit Cell V: 3,429 29 Å³ (Ca cu ated from Un t Ce)

X-Ray Powder Diffraction

H de

Powder Diffraction Data:

d-spacing	Intensity
2 90	(40)
2 66	(100)
1 54	(50)

Type Occurrence of Rondorfite

H de

Type Locality: ⓘ Caspar quarry, Be erberg vo cano, Ettr ngen, Mayen, Mayen Kob enz, Rh ne and Pa at nate, Germany

General Appearance of Type Material:

m nute gra ns to 0 5 mm

Geological Setting of Type Material:

therma y a tered ca c um r ch xeno tes n rocks contact ng euc te r ch ava s ags

Associated Minerals at Type Locality:

Tobe mo e	T aumas e	Te es e	Qua z	o a d e
aya e o s e e Se es	Mag e e	a e	Hyd oca um e	Hema e
g e	es ad e	Cusp d e	C o maye e	

Reference: M haj ov ć, T , C L Lengauer, T Ntaf os, U Ko tsch and E T manns (2004) Two new m nera s rondorf te, Ca8Mg[S O4]4C 2, and a marud te, K(1,Na)2(Mn,Fe,Mg)2(Be,A)3[S 12O30], and a study of ron r ch wada te, Ca12[(A 8S 4Fe2)O32]C 6, from the Be erberg (Be berg) vo can

Download: https //www researchgate net/prof e/Tamara Dordev c Or Djordjev c/pub cat on/249516977 Two new m nera s rondo f te Ca 8 MgS O 4 4 C 2 and a marud te KNa 2 MnFeMg 2 BeA 3 S 12 O 30 and a study of ron r ch wada te Ca 12 A 8 S 4 Fe 2 O 32 C 6 from the Be erberg Be berg vo cano E / nks/0c96052b197c2bff5f000000/Two new m nera s rondorf te Ca 8 MgS O 4 4 C 2 and a marud te K Na 2 Mn Fe Mg 2 Be A 3 S 12 O 30 and a study of ron r ch wada te Ca 12 A 8 S 4 Fe 2 O 32 C 6 from the Be erberg Be pdf

Synonyms of Rondorfite

H de

IMA1997 013

Other Language Names for Rondorfite

H de

German:	Rondorf t
Simplified Chinese:	罗道尔夫石
Traditional Chinese:	羅道爾夫石

Common Associates

H de

Associated Minerals Based on Photo Data:

E estad te	3 photos of Rondorf te assoc ated w th E estad te on m ndat org
Chegem te	1 photo of Rondorf te assoc ated w th Chegem te on m ndat org
Hydrogarnet	1 photo of Rondorf te assoc ated w th Hydrogarnet on m ndat org
Larn te	1 photo of Rondorf te assoc ated w th Larn te on m ndat org

Related Minerals - Nickel-Strunz Grouping

H de

9 AB 05	Tr mer te	CaM $^{2+}{}_2Be_3(S O_4)_3$	Mon 2/*m* *P*2 /*m*
9 AB 10	Larsen te	bZ $S O_4$	O th *mm*2 *Pna*2
9 AB 15	Esper te	$bCa_2Z{}_3(S O_4)_3$	Mon 2/*m* *P*2 /*b*

Fluorescence of Rondorfite

H de

In UV light: none

Other Information

H de

Health Risks: No nformat on on hea th r sks for th s mater a has been entered nto the database You shou d a ways treat m nera spec mens w th care

References for Rondorfite

H de

Reference List: Sort by Year (asc) by Year (desc) by Author (A Z) by Author (Z A)

M haj ov ć, T , C L Lengauer, T Ntaf os, U Ko tsch and E T manns (2004) Two new m nera s rondorf te, Ca8Mg[S O4]4C 2, and a marud te, K(1,Na)2(Mn,Fe,Mg)2(Be,A)3[S 12O30], and a study of ron r ch wada te, Ca12[(A 8S 4Fe2)O32]C 6, from the Be erberg (Be berg) vo cano, E fe , Germany Neues ahrbuch für M nera og e, Abhand ungen 179 265 294

Rastsvetaeva, R K , Zadov, A E , Chukanov, N V (2008) Crysta structure of ow symmetry rondorf te Kr sta ograf ya 53 226 232

Du sk , M , Bu ou, A , Marzec, K M , Ga usk n, E V , Wrza k, R (2013) Structura character zat on of rondorf te, ca c um s ca ch or ne m nera conta n ng magnes um n tetrahedra pos t on [MgO4]6 , w th the a d of the v brat ona spectroscop es and f uorescence Spectroch m ca Acta Pa t A Mo ecu ar and B omo ecu ar Spectroscopy 101 382 388

Du sk , M , B ewska, K , Wojtyn ak, M , Szade , Kusz, , Nowak, A , W za k, R , Kuback , , Ga usk n, E V (2015) Rondorf te type structure XPS and UV v s study Mater a s Research Bu et n 70 920 927

Internet Links for Rondorfite

H de

mindat.org URL: https //www m ndat org/m n 25682 htm
P ease fee free to nk to th s page

Search Engines: Look for Rondorf te on Goog e
Look for Rondorf te mages on Goog e

External Links:
Look for Rondorf te on Webm nera
Look for Rondorf te on W k ped a
Look for Rondorf te on M nera en At as
Raman and XRD data at RRUFF project
References and PDF down oads at RRUFF project
Amer can M nera og st C ysta Structure Database
Handbook of M nera ogy page PDF

Mineral Dealers:
Buy from David K Joyce minerals
Cal Neva Mineral Company - Quality Mineral Specimens For Sale
Buy rare minerals from Excalibur Minerals
Buy minerals from Anton Watzl minerals
Minerals from Australia and beyond - RocknCrystals
Top quality minerals from Kristalle of California
Fine Minerals from Weinrich Minerals, Inc.
Search for Rondorfite on Well-Arranged Molecules
The Arkenstone - Fine Minerals
Quality Minerals at Fair Prices
Wilensky Fine Minerals
Buy from McDougall Minerals

Localities for Rondorfite

H de

T s map s ows a se ec o of oca es a ave a ude a d o g ude coo d a es eco ded. C ck o e symbo o v ew fo ma o abou a oca y. T e symbo ex o oca es e s ca be used o ump o a pos o o e map.

Locality List

H de

T s oca y as map coo d a es s ed.
C ck fo fu e fo ma o o s occu e ce.
Good c ys a s o mpo a oca y fo spec es.
(T) Type oca y fo a va d m e a spec es.
~~S uck ou~~ M e a was e o eous y epo ed f om s oca y.

T s oca y as es ma ed coo d a es.
? d ca es m e a may be doub fu a s oca y.
Wo d c ass fo spec es o ve y s g f ca .
(R) s Reco ded oca y fo eve y g e se (eg va e es).
aded * Neve fou d a s oca y bu fe ed o ave ex s ed a some po e pas (eg f om pseudomo p s.)

A oca es s ed w ou p ope efe e ces s ou d be co s de ed as ques o ab e.

Czech Republic

South Moravian Region
B o Cou y D s c
Os ava y
Ros ce Os ava y coa f e d

Hršelová, P., Cempírek, J., Houzar, S., Sejkora, J. (2013): S,F,Cl-rich mineral assemblages from burned spoil heaps in the Rosice-Oslavany coalfield, Czech Republic. Can. Mineral.: 51(1): 171-188

Germany (TL)

Rhineland-Palatinate
Maye Kob e z
Maye
ge
Be e be g vo ca o
Caspa qua y **(TL)**
Vo dec e e bea g xe o

T. Mihajlović, C. L. Lengauer, T. Ntaflos, U. Kolitsch and E. Tillmanns (2004): Two new minerals rondorfite, Ca8Mg[SiO4]4Cl2, and almarudite, K(,Na)2(Mn,Fe,Mg)2(Be,Al)3[Si12O30], and a study of iron-rich wadalite, Ca12[(Al8Si4Fe2)O32]Cl6, from the Bellerberg (Bellberg) volcano, Eifel, Germany. N. Jahrb. Mineral. Abh. 179, 265-294.

in the collection of Christof Schäfer

Russia

Chelyabinsk Oblast
C e yab sk coa bas
Ba u skaya Vos oc aya 2 m e

Sharygin, V. V. (2015). Mayenite-supergroup minerals from burned dump of the Chelyabinsk Coal Basin. Russian Geology and Geophysics, 56(11), 1603-1621.

Kabardino-Balkaria
Baksa Va ey
Uppe C egem vo ca c ca de a (Ve k ec egemskaya ca de a)

Galuskin, E.V., Galuskina, I.O., Kusz, J., Gfeller, F., Armbruster, T., Bailau, R., Dulski, M., Gazeev, V.M., Pertsev, N.N., Zadov, A.E., Dzierżanowski, P. (2015): Mayenite supergroup, part II: Chlorkyuygenite from Upper Chegem, northern Caucasus Kabardino-Balkaria, Russia, a new microporous mayenite supergroup mineral with "zeolitic" H2O. European Journal of Mineralogy. 27, 113-122; Bailau, R., Gałuskin, E. V., Gazeev, V. M., & Gałuskina, I. O. Raman investigation of potential new mineral-Fe 3-analogue of wadalite from calcareous-silicate xenoliths of the Upper Chegem caldera, Northern Caucasus, Russia.

aka g M .
Xe o o.

Galuskina, I.O., Krüger, B., Galuskin, E.V. ,Armbruster, T., Gazeev, V.M., Włodyka, R., Dulski, M. & Dzierżanowski, P. (2015): Fluorchegemite, Ca7(SiO4)3F2, a new mineral from the edgrewitebearing endoskarn zone of an altered xenolith in ignimbrites from Upper Chegem Caldera, Northern Caucasus, Kabardina-balkaria, Russia; Occurrence, crystal structure, and new data on the mineral assemblages.

Canadian Mineralogist. 53, 325-344.

ⓘ Xe o o. 3

Galuskin, E.V., Galuskina, I.O., Gazeev, V.M., Dzierżanowski, P., Prusik, K., Pertsev, N.N., Zadov, A.E., Bailau, R., Gurbanov, A.G. (2011): Megawite, CaSnO3: a new perovskite-group mineral from skarns of the Upper Chegem caldera, Kabardino-Balkaria, Northern Caucasus, Russia. Mineralogical Magazine, 75, 2563-2572.

ⓘ Xe o o. 7

Galuskin, E. V.; Gazeev, V. M.; Lazic, B.; Armbruster, T.; Galuskina, I. O.; Zadov, A. E.; Pertsev, N. N.; Wrzalik, R.; Dzierzanowski, P.; Gurbanov, A. G. & Bzowska, G. (2009): Chegemite Ca7(SiO4)3(OH)2 - a new humite-group calcium mineral from the Northern Caucasus, Kabardino-Balkaria, Russia. European Journal of Mineralogy 21, 1045-1059.

South Ossetia

Greater Caucasus Mountain Range

Ke vo ca c a ea

S ad K ok vo ca o

ⓘ NW s ope

Galuskina, I.O., Krüger, B., Galuskin, E.V. ,Armbruster, T., Gazeev, V.M., Włodyka, R., Dulski, M. & Dzierżanowski, P. (2015): Fluorchegemite, Ca7(SiO4)3F2, a new mineral from the edgrewitebearing endoskarn zone of an altered xenolith in ignimbrites from Upper Chegem Caldera, Northern Caucasus, Kabardina-balkaria, Russia; Occurrence, crystal structure, and new data on the mineral assemblages. Canadian Mineralogist. 53, 325-344.; Środek, D., Juroszek, R., Krüger, H., Krüger, B., Galuskina, I., & Gazeev, V. (2018). New Occurrence of Rusinovite, Ca10 (Si2O7) 3Cl2: Composition, Structure and Raman Data of Rusinovite from Shadil-Khokh Volcano, South Ossetia and Bellerberg Volcano, Germany. Minerals, 8(9), 399.

M nera and/or Loca ty